



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/735,005	12/12/2000	Kazuyuki Ito	NEC 444	3384

7590 12/29/2003

Norman P. Soloway
HAYES, SOLOWAY, HENNESSEY, GROSSMAN & HAGE, P.C.
175 Canal Street
Manchester, NH 03101

EXAMINER

GEBREMARIAM, SAMUEL A

ART UNIT	PAPER NUMBER
----------	--------------

2811

DATE MAILED: 12/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/735,005

Applicant(s)

ITO, KAZUYUKI

Examiner

Samuel A Gebremariam

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 37-41 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 37-41 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 37 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: Claim 37 recites the limitation of "forming a trench in said semiconductor substrate, which trench partitions said dummy area patterns from active area patterns, by an etching process using said first photoresist pattern layer; forming a conductive layer over said semiconductor substrate". The above limitation leads to a process step that results in a structure where a trench is filled with a conductive layer. Since applicant does not disclose a trench filled with a conductor, it appears applicant has skipped some process steps.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 37 and 39-41, are rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art in view of Gilbert US patent No. 5,885,856.

Regarding claim 37 admitted prior art teaches (figs. 3A-3C and 4) a method for manufacturing a semiconductor device comprising the steps of: forming a conductive layer (202) over the semiconductor substrate (201) forming a photoresist pattern layer on the conductive layer using a photomask having gate patterns (P1) and (P2) corresponding to the active areas and dummy gate patterns (DP) corresponding to the dummy areas and patterning the conductive layer by an etching process using the photoresist pattern.

Admitted prior art does not disclose forming a first photoresist pattern layer, a first photomask and forming a trench in the semiconductor substrate which trench partitions the dummy area patterns from the active area by an etching process using the first photoresist pattern layer.

It is conventional and well known to form isolation trench using photolithographic process. Gilbert also teaches (fig. 1, col. 2, lines 41-60) forming isolation trench (13), which trench partitions the dummy area patterns (20) from the active area (14) using masking layer (12).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the first masking process for forming trench isolation trench structure taught by Gilbert in the process of admitted prior art in order to form isolation structures between the active region before forming the gate and dummy gate structures. Furthermore the combined process of admitted prior art and Gilbert results in a structure where each of the dummy gate patterns is a reduction of the corresponding dummy area patterns.

Regarding claims 39 and 40 admitted prior art teaches substantially the entire claimed method of claim 37 above except explicitly stating that the dummy areas and or dummy gates are arranged in at least two rows and/ or two columns and the row is shifted from another and the row and/ or at least one column is shifted from another column.

It is conventional and also taught by Gilbert (fig. 6 and 7) arranging device structures in an array as claimed.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to arrange the dummy gate and gate structures of admitted prior art device in the conventional manner in order to obtain high packing density.

Regarding claim 41 admitted prior art teaches substantially the entire claimed method of claim 37 including forming a plurality of dummy active areas and a plurality dummy gates on the dummy active areas (figs. 3A-3C).

Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over admitted prior art in view of Gilbert and in further view of Shimomura et al. US patent No. 6,140,687.

Regarding claim 38 admitted prior art teaches substantially the entire claimed method of claim 37 above except explicitly stating that the shape of the dummy area and/ or dummy gate is a circle.

It is conventional and also taught by Shimomura forming circular shaped gates.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to select circular shape dummy/gate structures since circular

Art Unit: 2811

structures allow for symmetrical arrangement of integrated circuit layout. Furthermore since it is known to form circular shaped gate electrodes it would have been obvious to a person of ordinary skill in the art to form circular dummy gate electrode.

Response to Arguments

3. Applicant's arguments filed 10/27/03 have been fully considered but they are not persuasive. Applicant argues Gilbert does not teach or suggest using a first masking layer to form trenches in the semiconductor substrate which partitions the dummy area patterns from the active area patterns. Figure one of Gilbert device clearly shows a semiconductor substrate with trench isolation (13) formed to separate active regions (14) from dummy structures (20) using masking layer (12) (see also col. 2, lines 41-60). Therefore examiner maintains the rejection to be appropriate. Furthermore the examiner suggests that applicant reviews the claims and clearly state the process steps in forming the semiconductor device.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel Admassu Gebremariam whose telephone number is 703 305 1913. The examiner can normally be reached on 8:00am-4: 30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 305-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 872-9306 for After Final communications.

Application/Control Number: 09/735,005

Page 6

Art Unit: 2811

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Samuel Admassu Gebremariam
December 23, 2003

A handwritten signature in black ink, appearing to read 'Eddie Lee', is positioned above the printed name and title.

EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800